DOCUMENT RESUME

ED 388 305 IR 017 454

AUTHOR Wolcott, Jack
TITLE Educating in the Hyperzone.
PUB DATE 94
NOTE 7p.; In: Educational Multimedia and Hypermedia, 1994. Proceedings of ED-MEDIA 94--World Conference on Educational Multimedia and Hypermedia (Vancouver, British Columbia, Canada, June 25-30, 1994); see IR 017 359.
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Cognitive Style; *Computer Assisted Instruction; *Computer Software Development; Higher Education; History Instruction; *Hypermedia; Learning Strategies; Problem Solving; *Student Developed Materials; *Student Research; Synthesis; Theater Arts
IDENTIFIERS *Philadelphia Project; Story Boards; University of Washington

ABSTRACT

The absence of an authoring agency in higher education is often reflected in the bewilderment of students who feel they have been forced to take courses which have no relevance to their life goals and interests. At the University of Washington School of Drama, a project was developed to involve undergraduates in the development of an open-ended hypermedia document by building a document out of students' research and scholarship. In "The Philadelphia Project," a hypermedia application was developed which would provide different learning environments for various learner types. The project focused on the city of Philadelphia and the Chestnut Street Theatre during the period between 1790 and 1835. In the first seminar, questions were explored on how people learn, and how computer assisted instruction (CAI) materials might be developed which could accommodate various learning strategies. A second seminar saw students working together to develop a storyboard of ideas, and then background research on the selected topic. In a period lasting over 18 months, preparations included costumes, rehearsals, and production of live action footage, the development of tutorials to accompany the clothing and costume pictorial data, and the production of a laser disk. The most important lesson to emerge from this experiment was that in hypermedia use, form follows problem solving and discoveries which result from students synthesizing information into knowledge and knowledge into understanding. (AEF)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Gary H. Marks

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC).

ED 388 305

Educating in the Hyperzone

Jack Wolcott
School of Drama DX-20
University of Washington, Seattle, WA, 98195, USA
wolcott@u.washington.edu

Abstract: This paper examines the disparity which often exists between what students expect of a college education and what they imagine that they have received. It proposes undergraduate involvement in the creation of hypertext and hypermedia documents as a means of synthesizing study in the core curriculum with study in fields of specialization, and provides examples from the development of "The Philadelphia Project," a hypermedia text.

The learning theory of William G. Perry, Jr. is introduced as the philosophical foundation upon which development and design of several hypertext and hypermedia projects in the School of Drama has been built.

Introduction

U.S. participants in the Viet Nam war reduced the earth's geography to two coordinate positions: "the World" – everything outside Viet Nam – and Nam, "the Zone." The distinction was clear cut and comforting: the World was real; the Zone was unreal. Higher education today presents a similar duality. Outside the institution is "the Real World," the place to which, after a short tour of duty in the "education zone," students will repair to spend the remainder of their lives, often embittered by the costly four years they have spent in-country, finding little to use from their experiences in the Zone.

It is easy to blame students for this situation, but the cause of this duality lies to some extent within the institution itself. The student approaches higher education with an expectation that he or she will discover interesting, relevant and, above all, useful information; useful because of its content, its coherence and its connectivity. Higher education clings tenaciously to an essentially eighteenth century model of the educated citizen, however, a model predicated upon the notion that a body of knowledge exists to which one should be exposed if one who would be called educated. This view is especially common in liberal arts programs, which insist the student become acquainted with a "core curriculum," usually made up of English literature and composition, history or philosophy, some mathematics and physical sciences, perhaps a little economics and a year of foreign language.

Information in the university data pool is overwhelming in its volume and complexity. There is no author in the hyperspace of higher education, no one who makes the links. Conspicuously absent from the core requirements of many liberal arts programs is Synthesis 101, a course to link the various disciplines studied, which perhaps could help the student find the links between changes in demographics and consumer spending, for example, or between the breakdown of monarchies in Europe and the rise of Romanticism in novels and dramatic literature.

The absence of an authoring agency in higher education is often reflected in the bewilderment of students who feel they have been forced to take courses which have no relevance to their life goals and interests. "All I ever wanted," said a young woman with whom I spoke recently, "was to be a theatre major. Instead, I wasted two years studying ocean sedimentation and calculus and other subjects I will never use again."

IR017454

BEST COPY AVAILABLE

The Hyperzone

All of which brings me to the "hyperzone," where creating hypermedia becomes as important a learning tool as using hypermedia. Imagine a great plain, like something out of Rod Serling, littered with bundles of information. People wander aimlessly among the data bundles, picking out a bit here, a fragment there. In the center of the plain stands a portal. Pass through the portal and enter the world of Hypermedia, which promises to bring order to information bundles, to provide pathways between related bundles, to enable the pilgrim to explore new frontiers with confidence. "We cannot bring order to the other side of the portal" the inhabitants of Hypermedia tell the newcomers, "but we can show you how the bits and fragments you have acquired along the way relate to what we have here. You will have to help us, though, perhaps even retracing your steps to bring more things from the bundles you have opened on the other side of the portal."

In this model, hypermedia becomes a process, rather than a product. In the "hyperzone," activity on each side of the portal is of equal importance. Indeed, the hypermedia artifact cannot exist without input from the chaos of the liberal arts. The preparation of the hypermedia document becomes the synthesizing process so often found missing in higher education today.

At the University of Washington School of Drama's Center for Explanation, the name for which is taken from an article by Scott Kim in "The Art of Human-Computer Interface Design," (Brenda Laurel, editor, 1990) we have been conducting research for the past several years to integrate the widely scattered course work of the core curriculum into the study of theatre history. The discipline of theatre history, essentially a product of the twentieth century, has been characterized from its inception by its insularity. Until quite recently, the student of theatre history learned of actors and directors, of plays and playwrights, and of theatre buildings and theatre companies. Rarely was the theatre presented in a social, economic or political context, however. Indeed, one came away from the study of the theatre's history with the sense that this art existed in splendid isolation, free from the censorship of Oliver Cromwell, the rigors of the French Revolution and the persecutions of the McCarthy era.

Hypermedia and Theatre History

The Beginnings

In 1988, a colleague and I determined to approach the discipline from a new direction. Our plan was to involve undergraduates in the development of an open-ended hypermedia document, building the document out of student's research and scholarship.

The seed of this project had been planted over a year before, when a number of students who had taken a CADD class with me asked if there was anything they could do to hone these newly acquired skills. I proposed that they assist me in developing a tutorial on "Florimène," a seventeenth century English court entertainment, which would be used by students in beginning theatre history classes.

Working with the primary evidence from the English court in London – mostly drawings and written accounts of the extravaganza – the students found it necessary to explore seventeenth century drafting and construction conventions, and to research the politics of the court, the writing traditions of this entertainment form, and the music, clothing and court protocols as well. In short, they turned outside the discipline of theatre history to resolve problems within the discipline. Moreover, they became immersed in the processes of scholarship, finding and evaluating evidence, relating one piece of evidence to another, and determining how best to sequence and display information so that others might learn through the experience of using the "Florimène" courseware.

"Florimène" consists of fifteen short tutorials, which are accessible from each other and from an index as well. The user may move freely among the tutorials, or abandon them entirely and search out specific aspects of the entertainment through the index.

The successful development of the "Florimène" tutorial, which was produced using IBM's "Storyboard," suggested that rather than learning by using a computer application developed by someone else, students could also learn by creating an application themselves. Moreover, in the process of developing the application, students could be guided to make connections between what they had learned outside the department and what they were studying as theatre majors. Parenthetically, but of no small significance, the application developed in this process could then be used by students in other programs in the School.

William G. Perry, Jr.: A Philosophical Basis

The structure of the courseware and the enthusiastic reception of "Florimène" among the eighty students who served as the test group for the program was of special interest. Much of the computer assisted instructional (CAI) material available in 1988 was designed with a single learning style in mind, often consisting of drills, with branching and remediation. Students who learned by drawing inferences from primary source materials, or who learned by looking at numerous examples and formulating conclusions, had little material to which they could turn. Was it possible, we wondered, to create a single learning application which could serve numerous learning styles?

The research of William G. Perry, Jr. at Harvard University suggested an approach to CAI which seemed promising. Between 1954 and 1963 William Perry, who was director of the Bureau of Study Counsel, and his colleagues undertook research to discover how students learn in the college years. (Perry, "Forms of Intellectual and Ethical Development in the College Years," 1970) Perry suggested a developmental model of nine positions. At one end of a continuum is what Perry calls the "dualistic" learner, the student whose intellectual frame of reference is in terms of right and wrong answers. Challenged by ambiguity and supported by structure, the dualistic student can be moved to a new position, what Perry calls the position of early and late "multiplicity." Here the student begins to understand that not all knowledge is known, and that there are perhaps areas in human experience where answers are unknowable. Slowly, the student begins to rely upon his or her own powers of intellect, rather than upon the work of others.

Finally, students may move to what Perry calls the positions of "contextual relativism" a position in which the student must examine evidence, draw conclusions from the evidence and the circumstances in which it is found, and make moral and ethical decisions regarding how to act upon his or her conclusions.

The Philadelphia Project

Research and Development

With the experience of "Florimène" behind us, and Perry's work providing a theoretical base from which to proceed, our goals as we began work in the fall of 1988 on what came to be known as "The Philadelphia Project" were to develop a hypermedia application which would provide different learning environments for various learner types, and to use students in the development of this application, engaging them in problems that would encourage them to draw on what they had learned in the core curriculum for solutions. Owl International's "Guide" authoring software was the centerpiece for this activity. The development platform is currently an Intel 486 machine, running at 50mh, which controls a Pioneer LD-V6000 laser disk player with output to a 21 inch Panasonic video monitor.

The decision was made to focus the project on the city of Philadelphia and the Chestnut Street Theatre during the period between 1790 and 1835, an era in which I have been conducting research intermittently since 1964. Culturally, socially and politically, Philadelphia in the Federal period was fascinating. For a brief period of time it was the Federal capital, it had a rich cultural tradition, was the center of strong feelings both against and in favor of the theatre, and had a constant infusion of emigrants – escaped Blacks from the South as well as newly arrived Europeans. Moreover, the Chestnut Street Theatre was the United States' first theatre building expressly constructed for a professional company. Its company enjoyed a long and prosperous tenure in the city.

Hypermedia seemed an ideal environment in which to manage the fragmented data which survives the Chestnut Street Theatre, often only a sentence or two, a scrap of paper with a sketch, or an engraving or watercolor. Computer management of the primary evidence would permit weaving together into a coherent and accessible whole the bits and pieces which otherwise virtually defy organization and presentation.

We began with an undergraduate seminar of about fifteen students. This seminar had as its goal to explore questions of how people learn, and of how CAI materials might be developed which could accommodate various learning strategies. The first half of the seminar focused on Perry's schema. In the second half of the seminar each student developed a short tutorial which would be appropriate for a specific learner type. Special effort was taken to build in challenges which would prompt each learner type to move toward a new position. The seminar concluded with sessions in which attempts were made to modify and integrate tutorials in such a way that a single tutorial might serve several learning styles.

A second seminar saw students, many of whom had been in the earlier class, working together to develop a storyboard of ideas from which the final project would be developed. Each student was encouraged to suggest topics relating to the theatre, from which "brainstorming" sessions would begin to suggest broad links to the key topic. A student with an interest in theatrical costume design suggested "costume," for example. This led to a separation of "theatrical clothing" and "street clothing," which in turn led to questions such as where clothing came from in the early 1800's; whether the U.S. was producing its own textiles or whether these were being imported from England and the Continent; who did the styling and sewing of clothing, and how fabrics were dyed. Students who had studied economics raised questions regarding tariffs, which carried discussion to the various embargo acts which gave rise, in part, to the American Revolution. Finally, questions were raised concerning the extent to which clothing was related to social and economic class: how clothes were signifiers and what they signified.

In another example, "stage lighting" was proposed. This prompted questions of how homes, theatres and other public buildings were illuminated during the period of the study; how gas lighting was introduced to the theatre and how gas was generated; and of what the aesthetic effects of lighting with gas versus lighting with candles and oil lamps? Another line of inquiry developed around the question of how painting techniques had changed with the introduction of gas lighting, both because the viewer could see more clearly under the new illuminant and because many pigments blackened in the presence of the sulphur in the gas. The production of illuminating gas raised questions about the chemistry of distillation; about what role coke – a byproduct of the gasification process – played in the economics of manufacture in Philadelphia; and about the sources of bituminous coal and how it was transported to the city.

Once a basic storyboard of ideas had been proposed, students selected a topic and spent the second half of the seminar doing background research. While all these topics have their origins in theatre applications – costuming, candle and gas lighting, for example – the strategy of the seminar was to turn all inquiry outward. Not only did this encourage students to consider the institution of the theatre in the broader context of its parent society, but it encouraged students to draw upon their educational experiences outside the drama curriculum in an attempt to position the theatre relative to the society it served. To draw on my earlier metaphor, students were at work in the hyperzone without yet being at work with hypermedia tools.

Preparation

Owing largely to student enthusiasm for these topics, the Chestnut Street Theatre building and clothing were chosen as pilot projects for the construction of a hypermedia document. It was clearly understood by all involved that this was an open-ended project, one which would be concluded by entropy alone. Additional topics could be added as enthusiasms arose.

The actual accumulation of data for the hypermedia text took several directions. A three dimensional CADD model of the Chestnut Street Theatre building was developed. Students working on this project had only a measured elevation of the building's facade and a plan of the first floor. Additionally, the building, which

burned to the ground in 1820, is represented by sketches on the back of an envelope and on bits of paper, and by the fragmented comments of actors and others who worked at the théatre.

Reconstructing an historical building by developing a three dimensional model such as this requires essentially the same skills and understanding of architecture, construction and engineering that would actually have been required to build the theatre in 1794. Solving the problems they encountered led students to an understanding of the aesthetics of Palladian and Georgian architecture, as well as to an understanding of eighteenth century construction practices; the economics of the tontine system, under which the building was financed; and the social and political climate of eighteenth century Philadelphia and how this affected physical arrangements in the theatre building.

Meanwhile, and this "meanwhile" lasted over eighteen months, undergraduate and graduate students were at work preparing materials for the clothing portion of the project. These preparations included the rehearsal and production of live action footage which would illustrate nineteenth century stage settings with actors in period clothing moving about, the development of tutorials which would accompany the clothing and costume pictorial data, and the production of a laser disk. Much of this effort was carried out in conjunction with staff from the Historic Clothing Collection of Seattle's Henry Art Gallery. Drama students thus had a unique opportunity to work with professionals whose expertise led them to understand clothing and costume in ways uniquely different from the understanding of the theatrical costume practitioner.

A graduate student in theatrical costuming prepared a series of costume drawings which depict the silhouette and overall characteristics of clothing in each decade from 1790 to 1850. Clothing which corresponded to these plates was selected from the Henry Art Gallery and from the School of Drama theatrical costume collections by students and staff. Tutorials based on this material were roughed out by a group of graduate and undergraduate students. The tutorials paid special attention to the style, construction and ornamental details of each garment, and a shot-list was prepared from this work for use later when the clothing was readied for photographing. Finally, prints and drawings which supported the clothing tutorials were identified.

During this research and preparation phase a doctoral candidate in the School of Art mounted an exhibit for the Henry Art Gallery which traced the development of the Kashmir shawl in the nineteenth century. This exhibit focused not only on the art of weaving illustrated by this medium, but also on the shawl as a socio-economic indicator in society. Upon hearing of "The Philadelphia Project," the curator of the exhibit not only offered the opportunity to photograph the exhibit for the laser disk, but agreed to write a tutorial as well.

The involvement with the shawl exhibit led to a surprise offer by a clothing historian whose specialization was shoes. He developed a pictorial database of period shoes for inclusion on the laser disk, as well as a tutorial based on this material.

In 1992, nearly a thousand images were recorded to video tape in preparation for producing the laser disk. These included over-views and close-ups of each garment, shawl and print so that, in effect, a viewer may examine every detail of the piece as though it were in hand. Additionally, full-motion sequences show what appear to be actors on the nineteenth century stage. In reality, these sequences consist of actors from the School, in period costume, chroma-keyed into the settings of a three foot by four foot toy theatre. Undergraduate students were involved throughout with the decision-making process which led to the video disk, with the video shoots and with editing the master tape. With this data now available to them, both the Chestnut Street Theatre building team and the students working on the clothing database were ready to pass through the portal into the computer managed portion of the hyperzone.

Construction of the Hypermedia Document

Since there is no closure, no urgency to create a finished product to be hurried off to market, design in "The Philadelphia Project" has been evolutionary rather than prefigured. The underlying principles which have informed choices in design have been those of William Perry.

The project has been shaped so that users in need of structure may explore the entire database through tutorials. Expert users may choose to move through the database making use of indexes and search-and-browse structures, ignoring the tutorials entirely. The user in the middle ground might choose to begin in a tutorial on seating in the theatre auditorium, move out to explore the index to the shawl collection and women's dress in 1830, become lost in this rich visual environment and turn back to the tutorial for help.

Student developers are strongly encouraged to experiment: there are no mistakes, only choices that don't work as well as others might. Nowhere is this to be seen more than in interface design. The "look and feel" of this project has evolved over time, driven by the materials which are constantly being added to the project, by student's changing understanding of relationships within the database, and often by intense debate over how to structure links.

The problem of integrating the 3D model of the theatre building into "The Philadelphia Project" illustrates the typical evolution of an interface. Ideally, the model would be presented so that it could be rotated in real time, with every room in the building buttoned. The viewer would merely stop the rotation, click, and examine the history, uses and artifacts of the selected space. Failing this, the model might be kept in 3D CADD, so that it could be rotated easily for viewing.

Software and budgetary considerations do not permit either of these solutions, so students developed a series of bitmap drawings from the model, created an index, and linked the index to the drawings. This solution had the weakness of leaving the various parts of the building dissociated from each other. Although links in the drawings associated each graphic with other parts of the database, this was essentially a flat solution to a dimensional problem.

Anticipating difficulties in transferring a 3D vector drawing to a 2D bitmapped world, the CADD model was designed so that each wall and floor is on a separate layer. It is therefore possible to display the model from any rotation, removing walls and floors which are in the way. Thus, it was possible to create a kind of cell animation, or mosaic of views so that, in effect, a person can do a "walk through" or "fly around" of any portion of the building. After experimentation with "Guide," a solution was developed which places numerous drawings together on the screen. Each drawing is in a separate borderless window and all windows on the screen are simultaneously active. Careful placement of windows on the screen permits comparisons of various views. Buttons abound in each picture. Some buttons link to close-up details of the drawing, while others bring prints and drawings to the video monitor, or provide the user access to tutorials and indexes in which the user may find associated data.

The most important lesson to emerge from this experiment has been to understand the necessity for leaving loosely defined the shape of the hypermedia artifact. In architecture, form follows function. In the hyperzone, form follows problem solving and the discoveries which result from students synthesizing information into knowledge and knowledge into understanding.

"The Philadelphia Project" continues, changing shape each academic term as new students become involved. It is probably safe to conclude that few students who work on the project realize they are working in what I have referred to as the hyperzone. Students approach the idea of creating a hypermedia text warily if the idea is presented head on. It seems too daunting a task. But confront them with a problem, challenge them to organize complex data in such a way that it is responsive to this problem, and the hypermedia environment becomes a safe haven, a place where organization and synthesis seem to take place effortlessly, a place from which sorties may be made out of the comfort and safety of the major discipline and back into the intellectually challenging chaos of the liberal education.